

CLAIMS

1. A cationic dye compound for detecting a double stranded nucleic acid, comprising:
a cation group and a chromophore coupled to said cation group,
5 wherein said chromophore has a heteropolycyclic structure containing a nitrogen atom and said cation group is capable of binding to a double stranded nucleic acid.
2. The cationic dye compound according to claim 1, wherein
10 said cationic dye compound is represented by the following general formula (I):
$$X-(Y-Z)_n \quad (I)$$

where n denotes 1 to 12, X represents a chromophore having at least four pyrrole rings, Y represents a connecting group or
15 a direct bond between X and Z, and Z represents a cationic functional group, or a functional group whose property is convertible to a cationic property.
3. The cationic dye compound according to claim 1 or 2, wherein
20 said chromophore is selected from the group consisting of porphyrin, porphyrin derivatives, phthalocyanine, and phthalocyanine derivatives.
4. A method for detecting a hybrid nucleic acid by use of
25 a cationic dye compound, comprising:
providing a cationic dye compound comprising a cation group and a chromophore coupled to said cation group, said

chromophore having a heteropolycyclic structure containing a nitrogen atom;

bringing a nucleic acid probe and a sample containing a target nucleic acid into contact with each other under hybridization conditions to form a hybrid nucleic acid composed of said nucleic acid probe and said target nucleic acid;

binding said cationic dye compound onto said hybrid nucleic acid by adding the cationic dye compound before, during or after said hybridization; and

measuring spectroscopic properties of said cationic dye compound bound onto said hybrid nucleic acid.

5. The method according to claim 4, wherein said cationic dye compound is represented by the following general formula

(I):



where n denotes 1 to 12, X represents a chromophore having at least four pyrrole rings, Y represents a connecting group or a direct bond between X and Z, and Z represents a cationic functional group, or a functional group whose property is convertible to a cationic property.

6. The method according to claim 4, wherein said chromophore is selected from the group consisting of porphyrin, porphyrin derivatives, phthalocyanine, and phthalocyanine derivatives.

7. The method according to claim 4, further comprising:

immobilizing an analyte having said target nucleic acid or said nucleic acid probe onto a solid phase carrier to bring said analyte and said nucleic acid probe into contact with each other under hybridization conditions.

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8. An apparatus for detecting a hybrid nucleic acid by use of a cationic dye compound, comprising:

means for bringing a nucleic acid probe and a sample containing a target nucleic acid into contact with each other
10 under hybridization conditions to form a hybrid nucleic acid composed of said nucleic acid probe and said target nucleic acid;

means for binding said cationic dye compound onto said hybrid nucleic acid by adding the cationic dye compound before, during or after said hybridization, wherein said cationic dye
15 compound comprises a cation group and a chromophore coupled to said cation group, said chromophore having a heteropolycyclic structure containing a nitrogen atom; and

means for measuring spectroscopic properties of said cationic dye compound bound onto said hybrid nucleic acid.

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